

Original Research Article

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A study of autoimmune thyroiditis in thyroid swellings

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ABSTRACT

Background: The present study aimed to study occurrence, clinical presentation, biochemical status and management strategies, complications and clinical improvement during follow up of autoimmune thyroiditis in patients presenting with thyroid swellings.

Methods: The prospective study was carried out from 18 months i.e., from January 2016-June 2017 at Department of General Surgery, Bhaskar Medical College, Yenkapally, Moinabad, Ranga Reddy, Hyderabad, Telangana, India. A detailed clinical history was taken from all patients followed by clinical examination. Following investigations were performed on all patients. Haematological investigations (T3, T4, TSH, thyroid antibodies), fine needle aspiration cytology, Histopathology report and Thyroid scan. Data was analyzed using SPSS software (V.23.0).

Results: The occurrence of autoimmune thyroiditis was determined in 15 (22.73%) patients. Most of the patients were females. About clinical presentation; goitre was present in all 66 (100%) cases. In group A; following complications were seen at the time of 1 year follow up: 1(6.67 %) patient developed Graves disease, 2 (13.33%) patients who were initially euthyroid developed hyperthyroidism and thyroid lymphoma was detected in 2 (13.33%) patients. In group B, following complications were seen at the time of 1 year follow up; 4 (7.84%) patients who were initially euthyroid developed hyperthyroidism and 2 (3.92%) patients developed follicular thyroid carcinoma and mortality observed was 1 (1.96%) patient.

Conclusions: All cases of goitre should thus be comprehensively evaluated even though they might be asymptomatic.

Keywords: Thyroid swellings, Autoimmune thyroiditis, Autoimmune diseases

INTRODUCTION

The principal diseases of the human thyroid gland are goiter (diffuse or nodular), hyperthyroidism, hypothyroidism, autoimmune thyroiditis (AITD), and neoplasm.¹ The thyroiditis types cause inflammation of thyroid tissue and can release preformed hormone from the colloid space, causing thyrotoxicosis, which is transient and followed by recovery or development of hypothyroidism. In acute and subacute thyroiditis, thyroid tenderness and neck pain are often present. On the other hand, silent thyroiditis is devoid of the local symptoms.² The human AITDs broadly include Graves' disease and Hashimoto's thyroiditis which are the most common

causes of thyroid gland dysfunctions and nonendemic goiter.³ These conditions arise due to complex interactions between environmental and genetic factors and are characterized by reactivity to self-thyroid antigens which are expressed as distinctive inflammatory or antireceptor autoimmune diseases.⁴⁻⁶ Among the major AITD susceptibility genes that have been identified and characterized is the HLA-DR gene locus, as well as non-major histocompatibility complex genes including the CTLA-4, CD40, PTPN22, thyroglobulin, and thyroid stimulating hormone (TSH) receptor genes.⁷ The major environmental triggers of AITD include iodine, medications, infection, smoking, stress, and genetic predisposition to AITD which lead to novel putative mechanisms by which the genetic-environmental

interactions may lead to the development of thyroid autoimmunity.⁸ The first pathological features of AITDs were described in 1912 when patients with goiter exhibited diffuse lymphocyte infiltration, atrophy of follicular cells, presence of granulated thyrocytes (oncocytic cells or Hurte's cells), and fibrosis in the histological pictures of their thyroid tissues.⁹ The Hashimoto's thyroiditis disorder is directed against thyroid antigens and is the most common cause of hypothyroidism.¹⁰ The incidence is 0.3 to 1.5 per 1000 persons per year, and it is 4 to 10 times more common in women than in men.^{10,11} Hashimoto's thyroiditis is more prevalent in areas with a high dietary iodinized salt intake, and smoking increases the risk. Goiter can be seen on presentation, but thyroid atrophy is more common. Hashimoto's thyroiditis is associated with other endocrine diseases in polyglandular autoimmune failure syndrome (Addison's disease, type 1 diabetes mellitus, and hypogonadism). The diagnosis is made by clinical features, elevated TSH, low thyroid hormone, and the presence of anti-thyroid peroxidase (TPO) antibodies.¹² In a landmark study of Hashimoto's thyroiditis in India, 6283 schoolgirls from all over the country were screened.¹³ Among them, 1810 school girls had a goiter. Among them 764 subjects underwent a fine needle aspiration cytology, and of these subjects, 58 (7.5%) had evidence of juvenile AITDs (the term included both Hashimoto's thyroiditis and focal lymphocytic thyroiditis). Among fine needle aspiration cytology-confirmed cases of juvenile AITDs, subclinical and overt hypothyroidism was seen in 15% and 6.5%, respectively.¹³ The present study aimed to study occurrence, clinical presentation, biochemical status and management strategies, complications and clinical improvement during follow up of AITDs in patients presenting with thyroid swellings.

METHODS

Place of study

This study was conducted at Department of General Surgery, Bhaskar Medical College.

Type of study

The present study was a prospective study.

Duration

The study was carried out for 18 months i.e., from January 2016-June 2017.

Sample collection

The sample size was 66 patients.

Sampling methods

Consecutive patients who satisfied the inclusion criteria were taken up for the study.

Inclusion criteria

Patients presented to the department of general surgery with thyroid swellings and were willing to be a part of the study were included.

Exclusion criteria

Pregnant women and patients not willing to be a part of the study were excluded.

A detailed clinical history was taken from all patients followed by clinical examination. Following investigations were performed on all patients as haematological investigations (T3, T4, TSH, thyroid antibodies), fine needle aspiration cytology (FNAC), histopathology report and thyroid scan.

Statistical methods

Data was analyzed with MS Excel and Statistical Package for Social Sciences 23.0. Comparison between groups for all continuous or ordinal data was done by using unpaired student t-test. Categorical data was analysed using F-test or Chi-square test and presented as frequencies and percentages. A p value of <0.05 was considered significant.

Ethical approval

Approval was taken from the institutional ethics committee prior to commencement of the study.

RESULTS

Occurrence of AITDs

Occurrence of AITDs in the present study is depicted in Table 1. In the present study, out of a total of 66 (100.00%) patients who presented with thyroid swellings and underwent FNAC, the occurrence of AITDs was determined by FNAC in 15 (22.73%) patients who are referred to a group A. Among remaining 51 (77.27%) patients; referred to as group B the thyroid swellings were determined by FNAC to be non-auto-immune.

Table 1: Occurrence of AITDs in the study group.

Occurrence of AITDs	N	%
AITDs (group A)	15	22.73
NATS (group B)	51	77.27
Total	66	100

NATS: Non-autoimmune thyroid swellings.

Clinical presentation of the two study groups (A and B)

Clinical presentation of the two study groups is depicted in Table 2.

Table 2: Clinical presentation of the two study groups (A and B).

Clinical features	AITDs (Group A)	NATS (Group B)
Pain	2 (13.33)	8 (15.69)
Fever	4 (26.67)	7 (13.73)
Goitre	15 (100)	51 (100)
Weight loss	2 (13.33)	6 (11.76)
Weight gain	7 (46.67)	15 (29.41)

Group A

Clinical presentation in group A was as follows as 2 (13.33%) patients presented with neck pain and 4 (26.67%) patients presented with fever. Unexplained weight loss was the presenting feature in 2 (13.33%) patients and 7 (46.67%) patients complained of weight gain. Thus, 7 (46.67%) patients had showed clinical signs of overt hypothyroidism, 6 (40 %) patients were euthyroid and 2 (13.33 %) patients presented with hyperthyroidism.

Group B

Clinical presentation in group B was as follows as 8 (15.69%) patients presented with neck pain and 7 (13.73%) patients presented with fever. Unexplained weight loss was the presenting feature in 6 (11.76%) patients and 15 (29.41%) patients complained of weight gain. Thus in group B, 15 (29.41%) patients showed overt hypothyroidism; 30 (58.82%) patients were euthyroid and 4 (11.76%) patients were observed to be hyperthyroid.

Thyroid function status (clinical) of study groups (A and B) are depicted in Table 3.

Table 3: Clinical thyroid function status of study groups (A and B).

Clinical presentation	AITDs (Group A)	NATS (Group B)
	N (%)	N (%)
Hypothyroid	7 (46.67)	15 (29.41)
Euthyroid	6 (40.00)	30 (58.82)
Hyperthyroid	2 (13.33)	6 (11.76)
Total	15 (100)	51 (100)

TPO antibodies

Positivity for TPO antibodies among both the study groups is depicted in Table 4. In the present study in the AITDs (group A); 14 (93.33%) patients tested positive for TPO antibodies and 1 (6.67%) patient tested negative for TPO antibodies. In the non-autoimmune thyroid swellings (NATS) (group B) 10 (19.61%) patients tested positive for TPO antibodies and 41 (80.39%) patients tested negative for TPO antibodies.

Table 4: TPO antibodies positivity among both study groups (A and B).

TPO antibodies	AITDs (Group A)	NATS (Group B)	P value
	N (%)	N (%)	
TPO antibodies positive	14 (93.33)	10 (19.61)	
TPO antibodies negative	1 (6.67)	41 (80.39)	>0.05
Total	15 (100)	51 (100)	

Anti-thyroglobulin (Tg) antibodies

Anti-Tg antibodies positivity among both study groups is depicted in Table 5. In the present study in the AITDs (group A); 13 (86.67 %) patients tested positive for anti-Tg antibodies and 2 (13.33%) patients tested negative for anti-Tg antibodies. In the NATS (group B), 9 (17.65%) patients tested positive for anti-Tg antibodies and 42 (82.35 %) patients tested negative for anti-Tg antibodies.

Table 5: Anti-Tg antibodies positivity among both study groups (A and B).

Anti-Tg antibodies	AITDs (Group A)	NATS (Group B)	P value
Tg antibodies positive	13 (86.67)	9 (17.65)	
Tg antibodies negative	2 (13.33)	42 (82.35)	>0.05
Total	15 (100)	51 (100)	

Management of patients

Management of patients in both study groups (A and B) is depicted in Table 6.

Table 6: Management of patients in both study groups (A and B).

Management of patients	AITDs (Group A)	NATS (Group B)
	N (%)	N (%)
Thyroxine supplementation	6 (40)	21 (41.17)
Anti-thyroid drugs	1 (6.67)	5 (9.80)
Surgery (total thyroidectomy)	3 (20)	7 (13.72)
Symptomatic treatment	3 (20)	9 (17.64)
No treatment	2 (13.33)	9 (17.64)
Total	15 (100)	51 (100)

In the AITDs (group A); thyroxine supplementation was given to 6 (40%) patients, antithyroid drugs (neomercazole or carbimazole) to 1 (6.67%) patient, symptomatic treatment was given to 3 (20%) patients (propranolol, alprazolam, paracetamol, diclofenac); 2

(13.335) patients received no treatment and surgery was done in 3 (20%) cases due clinical indications (difficulty in deglutition) who underwent total thyroidectomy with neck dissection.

Group B

In the NATS (group B), thyroxine supplementation was given to 21 (41.17%) patients, antithyroid drugs (neomercazole or carbimazole) to 5 (9.80%) patients, symptomatic treatment was given to 9 (17.64%) patients (propranolol, alprazolam, paracetamol, diclofenac); 9 (17.64%) patients received no treatment. Surgery was done in 7 (13.72 %) cases due clinical indications (difficulty in deglutition) who underwent total thyroidectomy with neck dissection.

Follow-up

Improvement in clinical status in both study groups is depicted in Table 7. During the 1 month follow up, in the AITDs (group A); 8 (76.92 %) of patients treated (medical management or surgery) reported improvement in their symptoms; which increased to 10 (84.62%) at the 6 month follow up and at 1 year follow up a total 11 (61.54%) patients treated did not report deterioration in their clinical status (no new symptoms) or reported improvement in their symptoms. In the NATS (group B), during the 1 month follow up, 18 (42.85%) of patients treated (medical management or surgery) reported improvement in their symptoms; which increased to 24 (52.14%) at the 6 month follow up and at 1 year follow up a total 31 (73.80%) patients treated did not report deterioration in their clinical status (no new symptoms) or reported improvement in their symptoms. 10 (19.60%) patients did not report for 6m and 1 year follow up. Difference in improvement in clinical status in both study groups was not found to be significant statistically ($p>0.05$).

Table 7: Improvement in clinical status in both study groups (A and B).

	AITDs (Group A)	NATS (Group B)	P value
	N (%)	N (%)	
1 month follow up	8 (76.92)	18 (42.85)	
6 month follow up	10 (84.62)	24 (52.14)	>0.05
1 year follow up	11 (61.54)	31 (73.80)	

Complications

Complications in both study groups (A and B) are depicted in Table 8. In the AITDs (group A); following complications were seen at the time of 1 year follow up. 1 (6.67 %) patient developed Graves disease and 2 (13.33%) patients who were initially euthyroid developed hyperthyroidism. Thyroid lymphoma was detected in 2 (13.33%) patients and there was no mortality observed. In

the NATS (group B), following complications were seen at the time of 1 year follow up. 4 (7.84 %) patients who were initially euthyroid developed hyperthyroidism. 2 (3.92%) patients developed follicular thyroid carcinoma and mortality observed was 1 (1.96%) patient.

Table 8: Complications in both study groups (A and B).

Complications	AITDs (Group A)	NATS (Group B)
	N (%)	N (%)
Graves disease	1 (6.67)	0 (0.00)
Hyperthyroidism	2 (13.33)	4 (7.84)
Carcinoma	0 (0.00)	2 (3.92)
Thyroid lymphoma	2 (13.33)	0 (0.00)
Mortality	0 (0.00)	1 (1.96)

DISCUSSION

AITDs broadly include Graves' disease and Hashimoto's thyroiditis which are the most common causes of thyroid gland dysfunctions and non-endemic goiter. The present study was a prospective study conducted to study occurrence, clinical presentation, biochemical status, management strategies and complications of AITDs in a total of 62 patients presenting with thyroid swellings to a tertiary hospital.

Occurrence of AITDs

In the present study, out of a total of 66 (100.00%) patients who presented with thyroid swellings and underwent FNAC, the occurrence of AITDs was determined by FNAC in 15 (22.73%) (group A) patients and among remaining 51 (77.27%) patients; (group B) the thyroid swellings were determined by FNAC to be non-auto-immune. Marwaha et al in their study included 6283 healthy schoolgirls from different parts of the country.¹³ Goitrous girls (n=1810; 28% of subjects) were investigated for serum T4 and TSH, antithyroid microsomal antibody and antithyroglobulin antibody, urinary iodine excretion, and cytromorphology by FNAC. FNAC carried out successfully in 764 goitrous girls revealed juvenile AITDs (JAT) in 58 (7.5%), which included Hashimoto's thyroiditis in 43 (5.6%) and focal lymphocytic thyroiditis in 15 (1.9%). In their study those from a poor socioeconomic background had a significantly higher prevalence rate (31.9%) compared with girls from a higher socioeconomic status (23.8%).

Clinical presentation

Goitre was present in all 66 (100%) cases. In group A, 7 (46.67%) patients had showed clinical signs of overt hypothyroidism, 6 (40%) patients were euthyroid and 2 (13.33%) patients presented with hyperthyroidism. In group B, 15 (29.41%) patients showed overt hypothyroidism; 30 (58.82%) patients were euthyroid and

4 (11.76%) patients were observed to be hyperthyroid. Thomas et al in their study reported goiter was present in 100 cases out of a total of 144 cases, 14 cases were documented as absent goiter and no comment was documented in 30 cases.¹⁴ A significant number of patients had a goiter at presentation ($p<0.001$).

Pradeep et al in their study compared the indications, complications, and associated cancers in 271 patients who had undergone surgery for benign thyroid diseases.¹⁵ Significantly, more patients in Group A were hyperthyroid but the prevalence of hypothyroidism was not different between the groups. A total of 22.9% patients of Group A and 6% of Group B were hyperthyroid.

Antibodies

TPO and Tg

In the AITDs (group A); 14 (93.33%) patients tested positive for TPO antibodies and 13 (86.67 %) patients tested positive for anti-Tg antibodies. In the NATS (group B) 10 (19.61%) patients tested positive for TPO antibodies and 9 (17.65 %) patients tested positive for anti-Tg antibodies. In the study by Singh et al, 90% of Hashimoto's thyroiditis patients have high anti- TPO and anti-Tg antibody.¹⁶ Pearce et al found TPO antibodies in 90-95% of Hashimoto's thyroiditis but anti-Tg antibodies in only 20-50 per cent.¹⁷ TSH receptor blocking antibodies may cause transient hypothyroidism in infants born to mothers with Hashimoto's disease.

Management

In the present study, In the AITDs (group A); (n=15) thyroxine supplementation was given to 6 (40%) patients, antithyroid drugs (neomercazole or carbimazole) were given to 1 (6.67%) patient, symptomatic treatment was given to 3 (20%) patients (propranolol, alprazolam, paracetamol, diclofenac); 2 (13.33%) patients received no treatment and surgery was done in 3 (20%) cases due clinical indications (difficulty in deglutition) who underwent total thyroidectomy with neck dissection. Clinical symptoms were relieved after surgery in all 3 (20%) cases. Similarly, in the study by Thomas et al; of the 81 patients treated thyroxine supplementation was given to 63 patients, antithyroid drugs (neomercazole or carbimazole) to 19 and symptomatic treatment given to six patients (propranolol, alprazolam, paracetamol, diclofenac); 46 patients received no treatment and surgery was done in 17 cases. Pradeep et al in their study compared the indications, complications, and associated cancers in 271 patients who had undergone surgery for benign thyroid diseases.

Complications

In the AITDs (group A); following complications were seen at the time of 1 year follow up as 1 (6.67%) patient

developed Graves disease, 2 (13.33%) patients who were initially euthyroid developed hyperthyroidism and thyroid lymphoma was detected in 2 (13.33%) patients and there was no mortality observed. In the NATS (group B), following complications were seen at the time of 1 year follow up as 4 (7.84%) patients who were initially euthyroid developed hyperthyroidism and 2 (3.92%) patients developed follicular thyroid carcinoma and mortality observed was 1 (1.96%) patient.

CONCLUSION

In the present study, occurrence of AITDs was 22.73%, it was more common in second and third decade and in females. All patients presented with goitre and around 50% patients were clinically euthyroid. Patients were managed surgically or conservatively and were followed up at 1 month, 6 months and 12 months for detection of complications and improvement in clinical symptoms. All cases of goitre should thus be comprehensively evaluated even though they might be asymptomatic.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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